BURNED AREA REHABILITATION PLAN

SAM FORDYCE FIRE

(21550-9141-BZ97)

U.S. FISH AND WILDLIFE SERVICE

LOWER RIO GRANDE VALLEY NATIONAL WILDLIFE REFUGE

SEPTEMBER 26, 2007

FIRE DATE:	July 17, 2005
AGENCY/UNIT:	U.S. Fish and Wildlife Service Lower Rio Grande Valley National Wildlife Refuge Route 2, Box 202a Alamo Texas, 78516 Phone: 956-784-7500
LOCATION/SIZE:	Sullivan, Hidalgo County, Texas 23.5 acres
PREPARED BY:	U.S. Department of Interior U.S. Fish and Wildlife Service Michael Castillo, Ecologist

Submitted By: Bryan R Winton Date: 9-28-07

Bryan Winton, Refuge Manager, Lower Rio Grande Valley National Wildlife Refuge

BURNED AREA REHABILITATION PLAN REVIEW AND APPROVAL

I. Project Leader approval that the Burned Area Rehabilitation Plan meets approved land management plan management objectives.

Kenneth L. Merritt 9/28/07

Kenneth L. Merritt, Project Leader, South Texas Refuge Complex Date

II. Regional Fire Management Coordinator concurrence that the plan fits the technical definition for use of Rehabilitation finding.

John M. Kaiser 11/28/07

Acting *Regional Fire Management Coordinator, Region 2* Date

III. Rehabilitation Funding Approval (check one box below):

☐ Approved

☐ Approved with Revision (see attached)

☐ Disapproved

Regional Director, Region 2 Date

EXECUTIVE SUMMARY

Introduction

This Burned Area Rehabilitation Plan has been prepared in accordance with Department of the Interior and U.S. Fish and Wildlife Service (FWS) policy, the Lower Rio Grande Valley (LRGV) National Wildlife Refuge (NWR) Comprehensive Conservation Plan (CCP), and the South Texas Refuge Complex (STRC) Fire Management Plan. This plan continues actions that were conducted through initial Burned Area Rehabilitation (BAR) Plans submitted on September 9, 2005 and September 30, 2006 and is a companion to those plans. This plan provides rehabilitation recommendations for all land burned within the July 17, 2005 Sam Fordyce North Fire. Primary objectives of the Sam Fordyce North Fire Burned Area Rehabilitation Plan are to:

1. Reduce stands of invasive buffelgrass to less than 5% cover.
2. Rehabilitate a stable native shrubland community at the burn site, utilizing restoration techniques that promote quick establishment of a native woody plant-dominated overstory and discourage recolonization by the non-native buffelgrass and minimize the risk of future occurrence of alien grass-carried wildfires.

Part A of this plan provides basic information about the fire location, Part B identifies that this plan is an amendment to the initial submission in 2005, Part C identifies rehabilitation objectives, Part D describes team organization, Part E presents a summary of costs by jurisdiction, Part F describes rehabilitation treatment specifications and monitoring, and Part G describes additional actions required to complete restoration beyond the scope of this plan. The Burned Area Assessment Report is attached as Appendix I. Appendix II contains the National Environmental Policy Act (NEPA) compliance documentation summary. The Burned Area Rehabilitation Maps are found in Appendix III, and Appendix IV contains supporting documentation.

Fire Background

The Sam Fordyce North Fire was discovered on the Sam Fordyce North tract of LRGV NWR on July 13, 2005. It was contained on July 15 and declared out on July 17, 2005. The burned area is bounded on the south by the Military Road (caliche) and on the west by the Sam Fordyce Road (caliche). The perimeter on the north and east is a broad arc through former agricultural fields. The primary fuel was buffelgrass (*Cenchrus ciliarus*). The cause of ignition was a lightning strike (observed by acting FMO Pat Pearson); the fire was driven by prevailing southeast winds. The fire perimeter was mapped on September 6, 2005, and the burned area was determined to be 23.5 ac (Appendix III). The entire burned area is contained on refuge-owned land. The fire and fire suppression activities damaged portions of the refuge-owned fence along the Sam Fordyce Road. No other damages to infrastructure or historic sites occurred.

The fire burned through a sparse stand of Texas ebony (*Pithecellobium ebano*) and huisache (*Acacia farnesiana*) trees that were planted in 1990. Since the fire, recruitment of honey mesquite (*Prosopis glandulosa*), Texas palo verde (*Parkinsonia aculeata*), lotebush (*Ziziuphus obtusifolia*) and other native

trees and shrubs has occurred naturally at low densities. These trees and shrubs range from 1 to 3 m in height. Some of the native woody plants were killed, but the majority resprouted from their bases. The herbaceous vegetation is dominated by buffelgrass that recovered quickly after the fire. The major impact of the fire on native vegetation was the removal of native trees and shrubs. Although buffelgrass is a valuable forage grass for domestic livestock, it is of low value to native insects or any of the 11 orders of native mammals that occur on the refuge.

The fire perimeter reached, but did not damage a historic concrete swimming pool located outside the north edge of the burn. This swimming pool was constructed for the benefit of National Guard troops stationed at this site in 1916-1917, and is the only remaining structure of the former town of Sam Fordyce.

Rehabilitation Approach

The Lower Rio Grande Valley NWR BAR approach has consisted of site assessment, planning, and exotic grass control measures to prepare the site for restoration of native subtropical evergreen forest vegetation. Exotic grass control measures consisted of 6 repeated treatments of Glyphosate herbicide at more or less regular intervals over a 20 month period extending from January 2006 through September 2007. Refuge technicians conducted 3 follow-up spot applications of Glyphosate herbicide to touch-up small spots missed by contractors. This process has been completed and the site is now ready for the implementation of treatments to restore native vegetation.

Restoration treatments consist of broadcast seeding of native herbaceous plants immediately followed by planting seedlings of native trees and shrubs followed by site maintenance and subsequent augmentation plantings. We anticipate that the broadcast of native herbaceous plants will establish quickly and produce an abundant crop of seed within one year, thereby minimizing subsequent re-invasion by buffelgrass. 10 lbs. of native forb seed was collected locally during 2006 and 2007 and stored, and mixed with 83.75 lbs lbs of native forb seed purchased directly from seed suppliers in August of 2007. This mixure was broadcast at a rate of 3.7 lbs./acre using a tractor-mounted seed spreader immediately prior to planting 13,045 containerized seedlings for this project were grown under contract by local vendors and were delivered to the LRGV Refuge in August and September of 2007. Deep plow furrows were established through contract with a local farmer in October 2007 using a mechanical subsoil deep plow. Approximately 10,000 native tree and shrub seedlings were then planted by contracted laborers into the furrow between October 23 and 25, 2007. Composition of plant species used in rehabilitation effort are based upon existing native vegetation occurring on an adjacent portion of Sam Fordyce North tract, as well as the Havana, Yturria Brush and other tracts in this vicinity (Appendix V).

Monitoring to assess the safety and logistical limitations of the site took place immediately following the fire. Subsequent monitoring to determine effectiveness of herbicide applications occurred 9 times in timing with applications and continued through completion of herbicide applications.

Rehabilitation tasks for the following and final year are summarized as follows:

- Augmentation planting of 3,525 native trees and shrubs is planned for late June of 2008 (150 seedlings/acre)
- Spot application of Fluazifop-P butyl herbicide will be applied as needed through July of 2008.

- Monitoring will continue over the 10-month period to determine whether broadcast seeding was effective, to determine extent to which tree and shrub seedlings were planted on appropriate spacing, to evaluate seedling survival at 6 months and 1 year post planting, to track reinvasion of site by exotic grasses, and to ascertain effectiveness of follow-up spot applications of herbicide in controlling exotic grasses. In addition, photographs of site will be taken prior to treatment, 6-months following treatment, and one-year following treatment to document visual changes in vegetation structure and composition and results of treatments.

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PART A - FIRE LOCATION AND BACKGROUND INFORMATION

Fire Name	Sam Fordyce North
Fire Number	21550-9141-BZ97
Agency Unit	SRR
Region	2
State	TX
County(s)	Hidalgo
Ignition Date/Cause	07-13-05 / Lightning
Zone	SACC
Date Fully Contained	07-15-05
Jurisdiction	FWS 23.5 Acres
other jurisdictions	None
Total Acres	23.5 Acres
Date Controlled	07-17-05

PART B - NATURE OF PLAN

Type of Action (check one box below)

	Initial Submission
X	Amendment to the Initial Submission

PART C - REHABILITATION ASSESSMENT

Rehabilitation Objectives

1. Rehabilitate a stable native plant community at the burn site, utilizing native plant species and restoration techniques that will minimize recolonization by introduced grasses.
2. Reestablish habitat suitable for use by native plant and animal species.

PART D - TEAM ORGANIZATION, MEMBERS, AND RESOURCE ADVISORS

I. Burned Area Emergency Response Team Members and Resource Advisors.

Position	Team Member (Agency)
Team Leader, Plan Preparation	Michael Castillo, Ecologist, LRGV NWR (FWS)
Public Information	Nancy Brown, Public Outreach Specialist, STRC (FWS)
Operations	Patrick Pearson, FMO STRC (FWS)
NEPA Compliance & Planning	Ernesto Reyes, Ecological Services (FWS)
Vegetation, GIS and Photography	Michael Castillo, Ecologist, LRGV NWR (FWS)
Wildlife Biologist	Mitch Sternberg, Wildlife Biologist, LRGV NWR (FWS)
Fire Ecologist, Resource Advisor	Mark Kaib, Fire Ecologist Southwest Region (FWS)
Resource Advisor	Bryan Winton, Refuge Manager, LRGV NWR (FWS)

PART E - SUMMARY OF ACTIVITIES AND COSTS

REHABILITATION ACTIVITIES COST SUMMARY TABLE - Sam Fordyce North Fire

Spec #	Title	Unit	Unit Cost	No. Units	No. Times	Work Agent	Cost
1	Site preparation	Acre	$110	23.5	3	SC	$7,742
2	Propagation and planting of native tree and shrub seedlings – 150 seedlings/acre	Acre	$229.53	23.5	1	SC	$5,394
3	Spot application of Glyphosate herbicide	Hour	$21.56	96	1	FA	$2,106
4	Monitoring	Hour	$21.98	407	1	FA	$8,939
	TOTAL COST						**$24,181**

PART F - INDIVIDUAL SPECIFICATION

TREATMENT NAME	Contract application of Fluazifop-P butyl herbicide	**PART E SPECIFICATION #**	1
NFPORS TREATMENT CATEGORY*	Other Treatment	**FISCAL YEAR(S) (list each year):**	2008
NFPORS TREATMENT TYPE *	Chemical	**WUI? Y / N**	Y
IMPACTED COMMUNITIES AT RISK	None	**IMPACTED T&E SPECIES**	Walker's Manioc

* See NFPORS Restoration & Rehabilitation module - Edit Treatment screen for applicable entries.

I. WORK TO BE DONE (describe or attach exact specifications of work to be done):

Number and Describe Each Task:

A. General Description: Contract the application of Fluazifop-P butyl herbicide three times to the 23.5-ac old field at Sam Fordyce North burn.

B. Location/(Suitable) Sites: 23.5-ac old field

C. Design/Construction Specifications:

1. Apply 24 oz/ac (active ingredient) Fluazifop-P butyl herbicide in 5 – 10 gal water/ac, with surfactant and marking dye within label rates, with vehicle-mounted equipment. The refuge will supply the quantity of Fluazifop-P butyl herbicide, surfactant and marking dye. Contractor shall supply all necessary spraying equipment, fuel, water and transport to site.
2. Herbicide shall be applied to entire 23.5-ac area three times between October 1, 2007 and July 17, 2008 , while target grass is actively growing. Refuge personnel will indicate when applications should be made (minimum of 1 week advance notice).
3. Within 10 to 20 days of each main application, herbicide shall be re-applied as necessary to tough up areas missed during the main application, as evidenced by lack of herbicide symptoms (yellowing, wilting and tissue necrosis). Re-treatment is not necessary if specification number 4 has been met. Additional re-treatment(s) shall be made until Specification number 4 is met.
4. Each treatment (plus re-applications as necessary) is complete when 95% of the total treated area is killed.
5. Technicians will conduct touch-up applications between contracted sprayings.

D. Purpose of Treatment Specifications: Maintain site free or nearly free of buffelgrass.

E. Treatment Effectiveness Monitoring Proposed:

Refuge personnel will estimate effectiveness of herbicide applications by walking transects through treated area and taking photographs 7 – 10 days following treatment.. Refuge personnel will provide contract sprayer with maps showing location and size of untreated areas. Refuge personnel will inspect site within 10 days following re-treatment(s) to certify compliance with specifications listed in part C (above).

II. LABOR, MATERIALS AND OTHER COST:

▶ **PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item):** **Do not include contract personnel costs here (see contractor services below).**	**COST / ITEM**
TOTAL PERSONNEL SERVICE COST	n/a
▶ **EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item):** **Note: Purchases require written justification that demonstrates cost benefits over leasing or renting.**	**COST / ITEM**
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	n/a
▶ **MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):**	**COST / ITEM**

Fluazifop-P butyl herbicide + adjuvants @ $45.00/ac x 23.4 ac x 3 applications	$3,159
TOTAL MATERIALS AND SUPPLY COST	$3,159
▶ **TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):**	**COST / ITEM**
TOTAL TRAVEL COST	n/a
▶ **CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):**	**COST / ITEM**
Application: 23.5 ac x $65/ac x 3 applications	$4,583
TOTAL CONTRACT COST	$4,583

SPECIFICATION COST SUMMARY

FISCAL YEAR	PLANNED INITIATION DATE (M/D/YYYY)	PLANNED COMPLETION DATE (M/D/YYYY)	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLISHMENTS	PLANNED COST
FY2008	10/01/07	07/16/08	SC	acres	$65	Invasive Grass Reduction	$4,583
FY2008	10/01/07	07/16/08	CA, FA	acres	$45	Invasive Grass Reduction	$3,159
						TOTAL	**$7,742**

Work Agent: CA=Coop Agreement, FA=Force Account, G=Grantee, P=Permitee, SC=Service Contract, TSP=Timber Sales Purchaser, V=Volunteer

SOURCE OF COST ESTIMATE

1. **Estimate obtained from 2-3 independent contractual sources.**	C, M
2. **Documented cost figures from similar project work obtained from local agency sources.**	
3. **Estimate supported by cost guides from independent sources or other federal agencies**	
4. **Estimates based upon government wage rates and material cost.**	
5. **No cost estimate required - cost charged to Fire Suppression Account**	

P = Personnel Services, **E** = Equipment **M** = Materials/Supplies, **T** = Travel, **C** = Contract, **F** = Suppression

III. RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT:

List Relevant Documentation and Cross-Reference Location within the Accomplishment Report.

TREATMENT NAME	**Contract propagation and delivery of native tree and shrub seedlings – 150 seedlings / acre**	**PART E SPECIFICATION #**	2
NFPORS TREATMENT CATEGORY*	**Other Treatment**	**FISCAL YEAR(S) (list each year):**	2008
NFPORS TREATMENT TYPE *	**Biological**	**WUI? Y / N**	Y
IMPACTED COMMUNITIES AT RISK		**IMPACTED T&E SPECIES**	Walker's Manioc, Ocelot, Jagarundi

* See NFPORS Restoration & Rehabilitation module - Edit Treatment screen for applicable entries.

I. WORK TO BE DONE:

Number and Describe Each Task:

A. General Description: Issue contracts for the production and augmentation planting of 3525 containerized tree and shrub seedlings according to standard contract specifications used by LRGV NWR and plant seedlings as specified by Refuge personnel.

B. Location (Suitable) Sites: Contract nursery(s) and Sam Fordyce North burn.

C. Design/Construction Specifications:

1. Contractor(s) will produce seedlings and deliver to LRGV NWR on or before June 15, 2008.
2. Seedlings shall be transplanted between June 15, 2008 and July 16, 2008.
3. Seedlings shall be transplanted in ripped rows at spacing specified by Refuge personnel.

D. Purpose of Treatment Specifications: Restore native vegetation to the site of the Sam Fordyce North burn.

E. Treatment Effectiveness Monitoring Proposed:

Refuge personnel will inspect seedlings upon delivery to determine compliance with standard seedling contract specifications and supervise planting operation.

II. LABOR, MATERIALS AND OTHER COST:

▸ **PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below).**	**COST / ITEM**
TOTAL PERSONNEL SERVICE COST	n/a
▸ **EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item): Note: Purchases require written justification that demonstrates cost benefits over leasing or renting.**	**COST / ITEM**
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	n/a
▸ **MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):**	**COST / ITEM**
(All necessary material supplies were previously acquired by the Refuge). TOTAL MATERIALS AND SUPPLY COST	n/a
▸ **TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):**	**COST / ITEM**
TOTAL TRAVEL COST	n/a
▸ **CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):**	**COST /**

	ITEM
Propagate 3,525 seedlings x $1.15/seedling	$4,053.75
Plant 3,525 seedlings x $0.38/seedling	$1,339.50
TOTAL CONTRACT COST	$5,393.25

SPECIFICATION COST SUMMARY

FISCAL YEAR	PLANNED INITIATION DATE (M/D/YYYY)	PLANNED COMPLETION DATE (M/D/YYYY)	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLISHMENTS	PLANNED COST
FY2008	12/15/07	06/15/08	SC	Seedling	$1.15	Produce seedlings	$4,053.75
FY2008	6/15/08	07/16/08	SC	Seedling	$0.38	Plant seedlings	$1,339.50
						TOTAL	**$5,393.50**

Work Agent: CA=Coop Agreement, FA=Force Account, G=Grantee, P=Permitee, SC=Service Contract, TSP=Timber Sales Purchaser, V=Volunteer

SOURCE OF COST ESTIMATE

1. Estimate obtained from 2-3 independent contractual sources.	C,M
2. Documented cost figures from similar project work obtained from local agency sources.	
3. Estimate supported by cost guides from independent sources or other federal agencies	
4. Estimates based upon government wage rates and material cost.	
5. No cost estimate required - cost charged to Fire Suppression Account	

P = Personnel Services, **E** = Equipment **M** = Materials/Supplies, **T** = Travel, **C** = Contract, **F** = Suppression

III. RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT:

List Relevant Documentation and Cross-Reference Location within the Accomplishment Report.

Standard LRGV NWR seedling propagation and planting contract specifications attached in Appendix IV.

TREATMENT NAME	Spot application of Glyphosate herbicide	**PART E SPECIFICATION #**	3
NFPORS TREATMENT CATEGORY*	Other Treatment	**FISCAL YEAR(S) (list each year):**	2008
NFPORS TREATMENT TYPE *	Chemical	**WUI? Y / N**	Y
IMPACTED COMMUNITIES AT RISK	None	**IMPACTED T&E SPECIES**	Walker's Manioc, Ocelot,Jagarundi

* See NFPORS Restoration & Rehabilitation module - Edit Treatment screen for applicable entries.

I. WORK TO BE DONE (describe or attach exact specifications of work to be done):

Number and Describe Each Task:

A. General Description: Apply Glyphosate herbicide to small recurring buffelgrass patches as needed

B. Location/(Suitable) Sites: Sam Fordyce North Burn site.

C. Design/Construction Specifications:
Technicians will inspect rehabilitation site 3 times per year for one year, and will spot-apply herbicide as needed to control buffelgrass and other exotic species.

D. Purpose of Treatment Specifications: Prevent re-establishment of buffelgrass at Sam Fordyce North burn.

E. Treatment Effectiveness Monitoring Proposed:
Upon each visit Refuge personnel will take photographs and record visual observations to determine whether herbicide application objectives were met.

II. LABOR, MATERIALS AND OTHER COST:

▶ **PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below).**	**COST / ITEM**
GS-6 @ 20.05/hr + 3% est. increase start 1/1/2008 x 48 hrs/year GS-7 @ $22.62/hr + 3% est. increase start 1/1/2008 x 48 hrs/year	$ 2,069.57
TOTAL PERSONNEL SERVICE COST	$2,069.57
▶ **EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item): Note: Purchases require written justification that demonstrates cost benefits over leasing or renting.**	**COST / ITEM**
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	n/a
▶ **MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):**	**COST / ITEM**
Glyphosate herbicide at $12/gal x 3 gal	
TOTAL MATERIALS AND SUPPLY COST	$36
▶ **TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):**	**COST / ITEM**
TOTAL TRAVEL COST	n/a
▶ **CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):**	**COST / ITEM**

TOTAL CONTRACT COST	n/a

SPECIFICATION COST SUMMARY

FISCAL YEAR	PLANNED INITIATION DATE (M/D/YYYY)	PLANNED COMPLETION DATE (M/D/YYYY)	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLI SHMENTS	PLANNED COST
FY2008	10/01/07	7/15/08	FA	hours	$21.56	Treat Invasive Plants	$2069.57
FY2008	10/01/07	7/15/08	FA	gal	$12	Treat Invasive Plants	$36
						TOTAL	**$2,105.57**

Work Agent: CA=Coop Agreement, FA=Force Account, G=Grantee, P=Permitee, SC=Service Contract, TSP=Timber Sales Purchaser, V=Volunteer

SOURCE OF COST ESTIMATE

1. Estimate obtained from 2-3 independent contractual sources.	
2. Documented cost figures from similar project work obtained from local agency sources.	
3. Estimate supported by cost guides from independent sources or other federal agencies	
4. Estimates based upon government wage rates and material cost.	P, M
5. No cost estimate required - cost charged to Fire Suppression Account	

P = Personnel Services, **E** = Equipment **M** = Materials/Supplies, **T** = Travel, **C** = Contract, **F** = Suppression

III. RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT:

List Relevant Documentation and Cross-Reference Location within the Accomplishment Report.

TREATMENT NAME	Monitoring	**PART E SPECIFICATION #**	4
NFPORS TREATMENT CATEGORY*	Other Treatment	**FISCAL YEAR(S) (list each year):**	2008
NFPORS TREATMENT TYPE *	Monitoring	**WUI? Y / N**	Y
IMPACTED COMMUNITIES AT RISK	None	**IMPACTED T&E SPECIES**	Walker's Manioc, Ocelot, Jagarundi

* See NFPORS Restoration & Rehabilitation module - Edit Treatment screen for applicable entries.

I. WORK TO BE DONE (describe or attach exact specifications of work to be done):

Number and Describe Each Task:

A. General Description: Conduct monitoring to determine effectiveness of herbicide and augmentation planting rehabilitation treatments.

B. Location/(Suitable) Sites: Sam Fordyce North Burn site.

C. Design/Construction Specifications:

1. Monitor project to evaluate the effectiveness of herbicide and augmentation planting treatments toward stated objectives.
2. Conduct monitoring between October 1, 2007 and July 16, 2008.

D. Purpose of Treatment Specifications: Monitor effectiveness of rehabilitation treatments of Sam Fordyce North BAR site using permanent photographic monitoring stations, seedling sufrvial measures, and visual observations.

E. Treatment Effectiveness Monitoring Proposed:
Evaluate the effectiveness of treatments in rehabilitating the site.

II. LABOR, MATERIALS AND OTHER COST:

▶ **PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below).**	**COST / ITEM**
TOTAL PERSONNEL SERVICE COST	
▶ **EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item): Note: Purchases require written justification that demonstrates cost benefits over leasing or renting.**	**COST / ITEM**
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	n/a
▶ **MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):**	**COST / ITEM**
TOTAL MATERIALS AND SUPPLY COST	n/a
▶ **TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):**	**COST / ITEM**
TOTAL TRAVEL COST	n/a
▶ **CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):**	**COST / ITEM**
One GS-6 and one GS-7 technician @ an average of $21.98/hour x 407 hours	8,939.14

	TOTAL CONTRACT COST	$8,939.14

SPECIFICATION COST SUMMARY

FISCAL YEAR	PLANNED INITIATION DATE (M/D/YYYY)	PLANNED COMPLETION DATE (M/D/YYYY)	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLISHMENTS	PLANNED COST
FY2008	10/01/07	7/16/08	SC	hours	$21.98	Obtain monitoring results	$8,939.00
						TOTAL	**$8,939.00**

Work Agent: CA=Coop Agreement, FA=Force Account, G=Grantee, P=Permitee, SC=Service Contract, TSP=Timber Sales Purchaser, V=Volunteer

SOURCE OF COST ESTIMATE

1. Estimate obtained from 2-3 independent contractual sources.	
2. Documented cost figures from similar project work obtained from local agency sources.	
3. Estimate supported by cost guides from independent sources or other federal agencies	P
4. Estimates based upon government wage rates and material cost.	
5. No cost estimate required - cost charged to Fire Suppression Account	

P = Personnel Services, **E** = Equipment **M** = Materials/Supplies, **T** = Travel, **C** = Contract, **F** = Suppression

III. RELEVANT DETAILS, MAPS AND DOCUMENTATION INCLUDED IN THIS REPORT:

List Relevant Documentation and Cross-Reference Location within the Accomplishment Report.

PART G - RESTORATION REQUIREMENT

The following are post-rehabilitation implementation, operation, maintenance, monitoring, and evaluation actions beyond three years from fire control to ensure the effectiveness of initial investments. Estimated annual cost and funding source (subactivity) is indicated.

1. Monitor seedling survival and growth rates at 3-month, 6-month and 1-year post-planting ($384 – 1261).

2. Monitor invasive grass re-colonization and germination from dormant seed at 3-month, 6-month and 1-year post-planting ($384 – 1261).

3. Spot application of Glyphosate or Fluazifop-P butyl herbicide, as needed, at 1- and 2-years post planting ($1000 – 1261).

4. Monitor native plant and invasive plant densities and canopy coverage at 3 and 5 years post-planting. ($1,280 – 1261).

5. Long-term wildfire detection and suppression ($10,000 – 9141).

PART H – CONSULTATIONS

U.S. Fish and Wildlife Service
Chris Best, State Botanist
Ecological Services
512-490-0057

U.S. Fish and Wildlife Service
Ernesto Reyes, Fish and Wildlife Biologist
Ecological Services
956-784-7560

U.S. Fish and Wildlife Service
Mitch Sternberg, Wildlife Biologist
Lower Rio Grande Valley NWR
956-784-7592

U.S. Fish and Wildlife Service
Patrick Pearson, Fire Management Officer
Lower Rio Grande Valley NWR
956-784-7602

U.S. Fish and Wildlife Service
Mark Kaib, Regional Fire Ecologist
Region 2 Regional Office
505-248-6819

APPENDIX I - BURNED AREA ASSESSMENT REPORT

BURNED AREA ASSESSMENT REPORT
SAM FORDYCE FIRE (21550-9141-BZ97)

Prepared by Chris Best, Plant Ecologist
April 25, 2006

I. Objectives

The objectives of this burned area assessment include:

1. Report background information on the fire, including the cause, fuels, and impacts to infrastructure and historic sites.
2. Create an accurate map of the area affected by the fire.
3. Discuss the site history and land use.
4. Determine the fire's impacts to vegetation, wildlife and other natural resources, including rare, threatened and endangered species.
5. Compile site characteristics that are pertinent to restoration and management, including climate, geology, topography, soils, existing and potential vegetation, and wildlife habitat values.
6. Provide specific recommendations for restoration, monitoring and management of natural resources at the site.
7. Estimate costs associated with the recommended specifications.

II. Background Information and Site Description.

1. Fire Background Information.

The Sam Fordyce North fire (21550-9141-BZ97) was discovered at 5:30 pm on July 6, 2005, at the eastern unit of the Sam Fordyce North tract, Lower Rio Grande Valley (LRGV) NWR. It was contained and controlled on July 7. The burned area is in the central portion of the East unit of the Sam Fordyce North tract, bounded on the south by the Military Highway, on on the west by a county road, the on the north and east by unmanaged brush south of US Highway 83. There are no communities near the site. The ignition of the wildfire was observed by LRGV Fire Management Officer Patrick Pearson, who determined that the point of ignition was near the southeast corner of the burned area. The primary fuel was dry buffelgrass (*Cenchrus ciliarus*) approximately 24 inches tall.

2. Site Map. The fire was controlled along the county road and military highway that transverse this tract, and along suppression fire lines established along the north and east boundary of the fire. The burn areas was later mapped (see attached map, Sam Fordyce Burn 2005). The entire burned area is contained on refuge-owned land.

3. Site History and Land Use.

The fire occurred in a block of former agricultural fields, totaling 63.0 ac, bounded on the south by the Military Road, on the west by the Sam Fordyce Road, on the north by U.S. Highway 83, and the east by privately-owned farmland. Aerial photography reveals that this land supported an upland shrubland vegetation in 1975, but had been cleared for cropland by 1983. The refuge acquired this land in four separate purchases. The two western-most portions (Realty numbers 427b, acquired in 1986, and 422,

acquired in1989), totaling about 27 ac, were farmed by Wesley Vanderpool through the Cooperative Farming program. This area was direct seeded with Texas ebony, huisache and tepeguaje seeds in the fall of 1989 or spring of 1990. In the Revegetation Database, this area is SAMFOR08, and the revegetation effort is SAMFOR9003. The two eastern-most portions were farmed until the refuge acquired them in 1998 (Realty numbers 419a and 420a), and were abandoned at that time without revegetation.

The fire perimeter reached, but did not damage, an interesting historic site, a concrete swimming pool (see attached photographs). When the railroad reached this area, in 1904, the small town of Sam Fordyce was established here (apparently centered along the railroad line and Sam Fordyce road, about 700 ft south of the Military Road). A National Guard encampment was built here in 1916 as a protection from Mexican border raiders. The swimming pool, constructed for the benefit of troops stationed there, is the town's only remaining structure.

4. Impacts to Natural Resources.

The revegetation attempted in 1990 resulted only in a sparse establishment of Texas ebony and huisache trees. Additionally, honey mesquite, Texas palo verde, lotebush and other native trees and shrubs have established spontaneously at low densities. These trees and shrubs range from 1 to 3 m in height. Some of the native woody plants were killed outright by the fire, while the majority were top-killed and are coppicing from the bases of the trunks. The herbaceous vegetation consists of nearly 100% cover of buffelgrass (*Pennisetum ciliare*), an introduced, invasive grass, which recovered quickly after the fire. The major impact of the fire to native vegetation was the reduction of the size, density and cover of native trees and shrubs, and the stimulation of vigorous regrowth of buffelgrass. Although buffelgrass is a valuable forage grass for domestic livestock, it has very little value to rodents, quail and other seed-eating fauna, as well as the predators that depend on these prey. The rapid regeneration of buffelgrass, and the relatively slow growth of native woody vegetation, creates a self-perpetuating, fire-adapted non-native plant community that is susceptible to frequent wildfires.

5. Site Characteristics.

The soil type is McAllen fine sandy loam, ranging from 0 – 5% slope, overlying beds of caliche and gravel of the Goliad Formation. There are numerous active and abandoned caliche surface mines in the area, including an abandoned mine immediately south of the burn. In places, the overlying stratum of fine sandy loam is very shallow, as indicated by the abundance of gravel and fragments of indurated caliche at the surface. Rainfall averages about 20 inches per year, but varies widely from year to year. Due to the hot, subtropical climate, shallow soil depth above an impermeable bed of indurated caliche, and sloping topography, these caliche outcrops are quite xeric.

Existing native vegetation in similar areas immediately west of Sam Fordyce Road, as well as Havana, Yturria Brush, Cuevitas, Chicharra Banco and La Puerta tracts, consists of shrubs and small trees in a matrix of grass and forb species. The height of the vegetation is directly proportional to the depth of the soil stratum above the caliche bed. Deeper soils support an overstory of honey mesquite (*Prosopis glandulosa* var. *glandulosa*), *palo verde* (*Parkinsonia texana* var. *texana*), *junco* (*Koeberlinia spinosa*), Texas ebony (*Chloroleucon ebano*) and *anacahuita* (*Cordia boissieri*), 3 to 6 m tall. Where the soil is shallower, these species become shrubs 1 to 3 m tall. Other shrubs indicative of shallow soils are more abundant, including *cenizo* (*Leucophyllum frutescens*), blackbrush (*Acacia rigidula*), *guajillo* (*Acacia berlandieri*), kidneywood (*Eysenhardtia texana*), *coyotillo* (*Karwinskia humboldtiana* and woolly beebrush (*Aloysia macrostachya*). Where this vegetation type has been protected from overgrazing, an abundant herbaceous layer consists of palatable grasses, including plains bristlegrass (*Setaria leucopila* and *S. macrostachya*), Arizona cottontop (*Digitaria californica*) and four-flower trichloris

(*Trichloris pluriflora*), and forbs, such as awnless bush-sunflower (*Simsia calva*), Berlandier trumpets (*Acleisanthes obtusa*), blackfoot daisy (*Melampodium cinereum*) and *hierba del soldado* (*Waltheria indica*). Historically, these areas supported large herds of sheep, cattle and horses, so it is likely that the shrub component of the vegetation has increased significantly. Neverthless, the existing vegetation on caliche outcrops is among the most diverse in the Tamaulipan ecosystem, and supports a number of rare and endemic plants, include Runyon's huaco (*Manfreda longiflora*), huaco (*Manfreda sileri* and *M. variegata*), Runyon's Coryphantha (*Coryphantha macromeris* var. *runyonii*), Gregg's wild buckwheat (*Eriogonum greggii*) and yellow-show (*Amoreuxia wrightii*). Additionally, the Federally-listed Walker's Manioc (*Manihot walkerae*) is endemic to caliche outcrops. The type species of Walker's Manioc was collected from this general area; the three largest U.S. populations occur at Yturria Brush, Chicharra Banco and La Puerta tracts, within 15 miles of the Sam Fordyce burn site. Surface-mining of caliche, and invasion of buffelgrass, are the most significant threats to the survival of these populations.

The low shrublands that predominate in caliche outcrops provide excellent habitat for game animals, such as white-tailed deer and javelina, neotropical migratory birds, such as the black-chinned hummingbird, varied bunting and Bullock's Oriole, and resident birds, including the black-throated sparrow, pyrrhuloxia and cactus wren. Important endemic reptiles include the reticulated collared lizard, blue spiny lizard and banded gecko. Additionally, the state-protected Texas tortoise and Texas indigo snake are common in this habitat.

III. Recommendations for Restoration, Monitoring and Management.

The recommended rehabilitation of this site consists of the following specifications:

1. Thorough eradication of established buffelgrass bunches, and depletion of viable buffelgrass seed in the soil seed bank, by means of up to 6 repeated, well-timed applications of glyphosate herbicide over a period of 12 to18 months. After the initial application, repeat applications must be made when emerging tillers and/or germinated seeds have reached a blade length of 4 to 8 inches and are actively growing, but before they have begun flowering. In order to be successful, this requires close attention to weather and plant responses in the field.
2. Restoration of native shrub savanna vegetation through transplantation of 300 seedlings per acre of at least 30 species of shrubs and sub-shrubs, and direct seeding of at least 10 species of native grass and forb species at a density of at least 20 PLS/ft^2. The optimal season for seedling transplant is mid-September to mid-December, provided that available soil moisture from rainfall has penetrated the soil column at least to a depth of 18 inches. Direct seeding should be conducted immediately prior to seedling transplantation, after the last application of glyphosate.
3. Continue monitoring seedling growth and survival and invasive grass presence, and spot application of glyphosate and/or imazypyr herbicide to invasive grasses, if necessary, for two additional years.
4. Establish a pilot reintroduction site for Walker's Manioc in one or more areas where the caliche stratum is exposed, or within 50 cm of the surface.
5. Continue to suppress wildfire at this site. Successful establishment of native shrub savanna vegetation is expected to reduce the risk and severity of wildfire.
6. Once the native vegetation is well-established (5+ years after planting), prescribed burning should be considered as a potential management tool for reducing fuel loads and stimulating herbaceous vegetation.

Specifications 1, 2 and 3 are recommended for funding through a proposed Burned Area Rehabilitation Plan. Specification 4 should be funded as an endangered species recovery action, or through other sources. Specifications 5 and 6 carry beyond the 3-year span of Burned Area Rehabilitation Plans; these long-term management specifications may be funded through other funding sources.

IV. Estimated Costs of the Recommended Specifications (BAR Plan Only).

Specification	Cost per Unit	Quantity	Total
Contract application of Fluazifop-P Butyl herbicide and adjuvants	$65/ac	3 applications x 23.5 ac	$ 4,582.50
Purchase shrub and tree seedlings	$1.05/seedling	150/ac x 23.5 ac	$ 3,701.25
Contract planting of seedlings	$0.30/seedling	150/ac x 23.5 ac	$ 1,057.50
Labor - Spot application of Glyphosate herbicide	$21.34/hour avg	48 hours for GS 6-1 48 hrs GS 7-1	$ 2,109.60
Labor - Monitoring	$21.34/hour avg	96 hours for GS 6-1 96 hrs GS 7-1	$ 4,157.56
Contract Labor – Research & monitoring	14 days	$700/day	$ 9,800.00
TOTAL:			**$25,408.41**

V. Consultations.

Gary Moberly, Palmview Engine Captain, Lower Rio Grande Valley NWR: Site location and fire history.

David Blankinship, Senior Wildlife Biologist, Lower Rio Grande Valley NWR: Wildlife biology and habitat.

William MacWhorter, City Planner (retired), member of Weslaco Historical Society: History of Sam Fordyce and military encampment.

VI. References.

Carr, W. R., J. M. Poole, D. M. Price and J. R. Singhurst. 2004 (draft). The Rare Plants of Texas. Texas A&M University Press. College Station, Texas.

U.S.D.A. Soil Conservation Service and Texas Agricultural Experiment Station. 1981. Soil Survey of Hidalgo County, Texas. National Cooperative Soil Survey.

Department of Economic Geography. 1976. Geologic Atlas of Texas, McAllen – Brownsville Sheet. The University of Texas. Austin, Texas.

1983 CIR Aerial Photography Set for LRGV NWR Project Area (produced under contract for the refuge).

1987 CIR Aerial Photography Set for LRGV NWR Project Area Area (produced under contract for the refuge).

2002 CIR DOQQ Image, Sullivan City (Produced by Texas Natural Resources Information Service).

1990 Cooperative Farming Agreements, LRGV NWR (internal documents).

LRGV NWR Revegetation Database (internal database).

APPENDIX II - ENVIRONMENTAL COMPLIANCE

Federal, State, and Private Lands Environmental Compliance Responsibilities

All projects proposed in the Sam Fordyce North Burned Area Rehabilitation Plan that are prescribed, funded, or implemented by Federal agencies on Federal, State, or private lands are subject to compliance with the National Environmental Policy Act (NEPA) in accordance with the guidelines provided by the Council on Environmental Quality (CEQ) Regulations (40 CFR 1500-1508); Department of the Interior and U.S. Fish and Wildlife Service. This Appendix documents the Burned Area Emergency Response team considerations of NEPA compliance requirements for prescribed rehabilitation and monitoring actions described in this plan for all jurisdictions affected by the Sam Fordyce North Fire.

Related Plans and Cumulative Impact Analysis

Sam Fordyce North Burned Area Rehabilitation Plan *(*September 2006*)*. The Sam Fordyce North Fire Burned Area Rehabilitation Plan was reviewed and it was determined that actions proposed in the Sam Fordyce North Fire Burned Area Rehabilitation Plan within the boundary of the Sam Fordyce North Fire are consistent with the management objectives established in the Comprehensive Conservation Plan. The Comprehensive Conservation Plan NEPA compliance process (Environmental Assessment) specifically addresses:

- Biological Resources
- Air Quality
- Water Quality
- Wetland Preservation and Enhancement
- Compatibility and Service Policy on Recreational Uses
- Cultural Resources
- Socioeconomics

Cumulative Impact Analysis

Cumulative effects are the environmental impacts resulting from the incremental impacts of a proposed action when added to other past, present, and reasonably foreseeable future actions, both Federal and non-Federal. Cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time. The rehabilitation treatments for areas affected by the Sam Fordyce North Fire, as proposed in the Sam Fordyce North Fire Burned Area Rehabilitation Plan, do not result in an intensity of impact (i.e. major ground disturbance, etc.) that would cumulatively constitute a significant impact on the quality of the environment. The treatments are consistent with the above jurisdictional management plans and associated environmental compliance documents and categorical exclusions listed below.

Applicable and Relevant Categorical Exclusions

The individual actions proposed in this plan for the Sam Fordyce North fire burned area are Categorically Excluded from further environmental analysis as provided for in the Department of Interior and U.S. Fish and Wildlife Service categorical exclusions. All applicable and relevant

Department and Agency Categorical Exclusions are listed below. Categorical Exclusion decisions were made with consideration given to the results of required emergency consultations completed by the Burned area emergency response team and documented below.

Applicable Department of Interior Categorical Exclusions

516 DM 2 App; 2, 1.6
516 DM 6 App. 7.4 L (3)

Applicable U.S. Fish and Wildlife Service Categorical Exclusions

516 DM 6 App. 1.4 B (1)
516 DM 6 App. 1.4 B (3) iii
516 DM 6 App. 1.4 B (5)

Statement of Compliance for the Sam Fordyce North Fire Burned Area Rehabilitation Plan.

This section documents consideration given to the requirements of specific environmental laws in the development of the Sam Fordyce North Fire Burned Area Rehabilitation Plan. Specific consultations initiated or completed during development and implementation of this plan are also documented. The following executive orders and legislative acts have been reviewed as they apply to the Sam Fordyce North Fire Burned Area Rehabilitation Plan:

- National Historic Preservation Art (NAPA).
- Executive Order ll988. Flood plain Management.
- Executive Order 11990. Protection of Wetlands.
- Executive Order 12372. Intergovernmental Review.
- Executive Order 12892. Federal Actions to Address Environmental Justice in Minority and Low-income Populations.
- Endangered Species Act.
- Secretarial Order 3127. Federal Contaminated
- Clean Water Act.
- Clean Air Act.

CONSULTATIONS

Not applicable.

NEPA Checklist: If any of the following exception applies, the Burned Area Rehabilitation Plan cannot be Categorically Excluded and an Environmental Assessment (EA) is required.

(Yes)	(No)	
( )	(X)	Adversely affect Public Health and Safety
( )	(X)	Adversely affect historic or cultural resources, wilderness, wild and scenic rivers aquifers, prime farmlands, wetlands, floodplains, ecologically critical areas, or Natural Landmarks.
( )	(X)	Have highly controversial environmental effects.
( )	(X)	Have highly uncertain environmental effects or involve unique or unknown environmental risks.
( )	(X)	Establish a precedent resulting in significant environmental effects.
( )	(X)	Relates to other actions with individually insignificant but cumulatively significant environmental effects.
( )	(X)	Adversely effects properties listed or eligible for listing in the National Register of Historic Places
( )	(X)	Adversely affect a species listed or proposed to be listed as Threatened or Endangered.
( )	(X)	Threaten to violate any laws or requirements imposted for the "protection of the environment" such as Executive Order 1 1 988 (Floodplain Management) or Executive Order 1 1 990 (Protection of Wetlands).

National Historic Preservation Act

Ground Disturbance:

(X) None
( ) Ground disturbance did occur and an archeologist survey, required under section 110 of the NHPA will be prepared. A report will be prepared under contract as specified by the Burned Area Rehabilitation Plan.

A NHPA Clearance Form:

( ) Is required because the project may have affected a site that is eligible or on the national register. The clearance form is attached. SHPO has been consulted under Section 106 (see Cultural Resource Assessment, Appendix I).
(X) Is not required because the Burned Area Rehabilitation Plan has no potential to affect cultural resources (initial of cultural resource specialist).

Other Requirements

(Yes)	(No)	
( )	(X)	Does the Burned Area Rehabilitation Plan have potential to affect any Native American uses? If so, consultation with affiliated tribes is needed.
(X)	( )	Are any toxic chemicals, including pesticides or treated wood, proposed for use? If so, local agency integrated pest management specialists must be consulted.

I have reviewed the proposals in the Sam Fordyce North Fire Burned Area Rehabilitation Plan in accordance with the criteria above and have determined that the proposed actions would not involve any significant environmental effect. Therefore it is categorically excluded from further environmental (NEPA) review and documentation. Burned area emergency response team technical specialists have completed necessary coordination and consultation to insure compliance with the National Historic Preservation Act, Endangered Species Act, Clean Water Act and other Federal, State and local environment review requirements.

J Michael Custer — 9/28/2007

Ecologist, Lower Rio Grande Valley National Wildlife Refuge — Date

Kenneth L. Merritt — 9/28/07

Project Leader, South Texas Refuges Complex — Date

APPENDIX III – MAPS

Aerial Color infrared image showing the Sam Fordyce North Fire.

APPENDIX IV - SUPPORT DOCUMENTS

IV. 1. Native / Non-Native Plant Worksheet

Exhibit 6-1 NATIVE/NON-NATIVE PLANT WORKSHEET

This worksheet is required for all ESR Plans. These criteria will be evaluated by the interdisciplinary team preparing the ESR Plan. Each element requires a short narrative/rationale.

Proposed Native Plants in Seed Mixture

1. Are the native plants proposed for seeding adapted to the ecological sites in the burned area?
☑ Yes ☐ No Rationale:

2. Is seed or seedlings of native plants available in sufficient quantity for the proposed project?
☑ Yes ☐ No Rationale:

3. Is the cost and/or quality of the native seed reasonable given the project size and approved field unit management and ESR Plan objectives?
☑ Yes ☐ No Rationale:

4. Will the native plants establish and survive given the environmental conditions and the current or future competition from other species in the seed mix or from exotic plants?
☑ Yes ☐ No Rationale:

5. Will the current or proposed land management (e.g., wildlife populations, recreation use, livestock, etc.) after the seeding establishment period maintain the seeded native plants in the seed mixture?
☑ Yes ☐ No Rationale:

Use of native species for rehabilitation projects is required if all the answers to this portion of the worksheet are yes (assuming that the native plant species are available).

Proposed Non-native Plants in Seed Mixture N/A

1. Is the use of non-native plants necessary to meet objectives, e.g., consistent with applicable approved field unit management plans ?
☐ Yes ☐ No Rationale:

2. Will non-native plants meet the objective(s) for which they are planted without unacceptably diminishing diversity and disrupting ecological processes (nutrient cycling, water infiltration, energy flow, etc.) in the plant community?
☐ Yes ☐ No Rationale:

3. Will non-native plants stay on the site they are seeded and not significantly displace or interbreed with native plants?
☐ Yes ☐ No Rationale:

A "no" response requires additional analysis in the environmental assessment or selection of an alternate species in the seed mixture.

PROPOSED SEED MIXTURE

Non-native Plants	Native Plants

IV.2. LRGV NWR Seedling Contract Specifications

2006 SEEDLING CONTRACT & SPECIFICATIONS

BURNED AREA REHABILITATION AT LRGV NWR

ADMINISTERED BY VALLEY NATURE CENTER
301 S. BORDER AVENUE
WESLACO, TEXAS 78596
TEL. (956) 969-2475
E-MAIL: INFO@VALLEYNATURECENTER.ORG

1. GENERAL INFORMATION.

The Contractor shall furnish the necessary personnel, material, equipment, services and facilities (except as otherwise specified), to perform the following contract specifications. The Contractor shall collect the seeds of native tree and shrub species needed to fulfill this contract. Collection shall take place when the seeds become naturally available until sufficient seeds of different species have been collected to satisfy the production and growth of seedlings for this contract. The Contractor shall grow seedlings of specified native tree and shrub species in Plant Band containers of specified sizes. All seedlings shall be ready for delivery to the U.S. Fish and Wildlife Service (FWS) at the Lower Rio Grande Valley NWR (LRGV NWR) by October 1, 2006. The Contractor shall deliver the seedlings to the LRGV NWR between September 15 and October 1, 2006, according to schedules provided by the Valley Nature Center (VNC). This contract shall be administered by VNC, which shall conduct all contract negotiations and monitoring of contract compliance. VNC shall issue payment after October 1 and before December 15, 2006, for all seedlings delivered through this contract on or before October 1, 2006.

2. CONTRACTOR'S FACILITY LOCATION.

Contractor's facility shall be within the boundaries of Willacy, Hidalgo, Cameron and Starr Counties, and not more than 80 road miles from Refuge Headquarters located at Santa Ana NWR, 7 miles south of Alamo, TX on U.S. Highway 281, 1/4 mile east of FM 907. Past experience and history of seedlings grown outside the immediate region, not exposed to the local environmental conditions prevalent where the seedlings will ultimately be transplanted, has resulted in low survival and growth rates in the field.

3. CONTRACTOR'S BID QUOTATION AND PRODUCTION CAPACITY.

Potential contractors shall submit bid quotations to VNC on or before June 12, 2006. The bid quotations shall include the following information:

1) Price per seedling, in whole-cent units per seedling; for example, $0.65 or $0.66 per seedling. Bid prices including fractions of a cent per seedling, such as $0.653, will not be accepted.

2) Contractor's production capacity in numbers of seedlings. This statement is a realistic estimate of the maximum number of seedlings that the contractor is currently willing and able to produce with existing infrastructure and personnel and available finances. Contractor must demonstrate, by June 1, 2006, the capacity to produce the quantity of seedlings specified in an approved contract. If the Contractor fails to demonstrate the capacity to produce the numbers of seedlings specified in this contract and the Species Production Plan (see Section 7), the contract and Species Production Plan shall be modified to reflect the Contractor's actual production capacity.

If the contractor does not have sufficient seeds to produce some species, these seeds may be supplied by the LRGV NWR if available. The contractor must keep written records showing which seedlings were

produced by seeds supplied by the LRGV NWR. VNC shall deduct $0.03 per seedling from the contractor's bid price for all seedlings produced with seed supplied by the LRGV NWR.

4. CONTAINERS.

Seedlings shall be grown in "Plant Band" containers furnished by the LRGV NWR. Plant Bands are commercially available seedling containers made of biodegradable plasticized carton; Plant Bands are considered "root training" containers, because they have an open bottom which permits air-pruning of seedlings. Plant Bands are shipped folded, and must be opened into a square shape, packed with soil mix and stored on hardware cloth screens during cultivation of seedlings. The Plant Bands used in this contract come in two sizes. The larger size, referred to as "Midi" Plant Bands, are 8" x 1.5" HP (HP stands for "Heavy, Perforated"). The smaller size, known as "Mini" Plant Bands, are 6" x 1.25" HP.

4.a. Definition of Seedling.

For the purposes of this contract, the term "seedling" refers to a live plant grown in a Plant Band container.

5. SOIL.

Two types of soil (media) shall be used to fill Plant Bands: Native Soil Mix and Top Fill Mix.

5.a. Native Soil Mix.

Plant Bands shall be packed (as described in Section 5) and filled to within 1" of the top with the following "Native Soil Mix":

> 50% "Native" Soil, described below.
> 50% Medium Grade Vermiculite.
> Osmocote 13-13-13 Controlled Release Fertilizer or equal, mixed with the vermiculite and native soil at the rate of 12.3 Ounces (350 grams) per 10 gallons of above soil mix, or at manufacturer's recommended application for medium-sensitive plants. The salient characteristics of equivalent products, at a minimum, shall be: 1. Controlled 7- to 9-month formulation; and 2. Contains 13 percent Nitrogen, 13 percent Potassium and 13 percent Phosphate.

The native soil shall first be passed through 1/4" screen; only the "fines" shall be used in the soil mix. Soil clumps larger than 1/4" shall be crushed and re-screened or discarded. Equal quantities of screened native soil and medium grade Vermiculite shall be thoroughly mixed with the Osmocote Fertilizer at the rate of 12.3 ounces per 10 gallons of the soil/Vermiculite mix (350 ml fertilizer per 38 liters soil mix). This soil mix shall be evenly moistened before packing into containers. Soil mix is sufficiently moistened when a compact ball of soil can be formed with the hands, which can be handled without crumbling. Once prepared, the Native Soil Mix may be stored until needed; however, it shall not be exposed to rainfall, which would cause crusts and lumps to form which interfere with the filling of the Plant Bands. Native Soil Mix which has been exposed to rainfall shall be re-screened.

The "native" soil used in the mix shall be clay loam or silty clay loam collected from a location not more than 80 miles distance from Refuge headquarters. Local soils shall be used so that the plants shall be adapted to the soil types in the fields where the seedlings shall be transplanted. The soil used shall not be saline; the soil solution concentration of total dissolved solids must be less than 1,400 parts per million (ppm) (measured before mixing with Vermiculite and fertilizer in the following way: Soil samples are air-dried, powdered and passed through 1/8" screen; 100 g of the fines are mixed thoroughly with 200 ml of demineralized water and left to settle for 15 minutes; the supernatant is tested for total dissolved solids concentration with a soil conductivity meter). The Contractor shall consult with VNC on the source of native soil before purchasing, collecting or mixing large quantities. Samples of native soil shall be brought to

Refuge headquarters, where the texture and total dissolved solids shall be tested, free of charge. Once a soil source has been approved by VNC, the Contractor shall proceed with soil mixing and filling of Plant Bands.

The Native Soil Mix shall not contain any added sand, peat moss, conifer bark, manure, bone meal, blood meal or any other animal product. Sandy soils cannot be retained in Plant Bands and will not retain moisture in the field. Bark of pines, firs and other conifers induce an overgrowth of slime molds which produce spore masses capable of smothering the seedlings; these spore masses often form in September and October, after seedlings are delivered. Peat moss produces acid soils that are unlike the native alkaline soils of south Texas; however, peat moss-based top fill may be used as described below. Animal products attract coyotes and other wild animals which dig up seedlings in the field. The Native Soil Mix and its components must not be sterilized by heat (temperatures greater than 150° F), fungicides or by any other means. Unsterilized native soil contains beneficial fungi, known as "mycorrhizae", and Rhizobium (nodule-forming) bacteria, which improve seedling growth and survival in the field. The Contractor shall inform VNC personnel of any insecticide used on seedlings, so that potential safety hazards can be posted to others who handle seedlings.

5.b. Top Fill Mix.

The uppermost 1" (±1/4") shall be filled with sterile media composed of at least 75 percent of Peat Moss or Vermiculite, of a grade fine enough to pass through 1/8" screen. Acceptable formulations are available commercially and are referred to as "Seed Germination Media".

6. PACKING AND FILLING PLANT BANDS.

Plant Bands shall be packed with moist soil mix before filling, so that the soil mix will be retained in the Plant Band. A properly packed Plant Band can be handled vigorously or shaken without soil falling out of the Plant Band. Seedlings will not be accepted if soil falls out of the Plant Bands before they are packed in shipping crates. Plant Bands shall be packed by dropping packing boxes of soil-filled Plant Bands onto a hard flat surface no fewer than 3 times from a height of at least 3 feet. This requires the use of a device or mechanism which ensures that the packing boxes strike the flat surface evenly. The Plant Bands, which are shipped flat, shall be opened and folded twice along their seams, so that they shall retain a square shape when viewed from above. The opened Plant Bands are positioned vertically in a packing box. The packing box contains a wire grid which holds the Plant Bands in a vertical position and retains the square shape. Once the box is filled with Plant Bands, moist Native Soil Mix is filled to the brim of the Plant Bands. The packing box is positioned within the carriage of the soil packing device, the carriage is raised at least 3 feet and allowed to drop freely. Soil is again filled to the brim of the Plant Bands and the packing box is dropped 2 more times, until the soil level is 1" (± 1/4") below the brim of the Plant Bands. At this point, the Plant Bands may be removed from the packing box and handled, without loss of soil. The soil at the bottom end of the Plant Band shall have a firm, smooth appearance. If this is not the case, the soil moisture must be adjusted accordingly. Soil Mix which is too wet drips or slides out of the Plant Band. Soil Mix which is too dry crumbles and falls out of the Plant Band.

After packing, the Plant Bands are then top-filled to the brim with the Top-Fill Mix described in Section 5.b. The filled Plant Bands are now ready for planting, or they may be stored for up to one month. If stored, the soil in the Plant Bands may dry out and fall out of the Plant Bands. Filled Plant Bands, which have been stored, shall be thoroughly watered and left to soak for at least 30 to 60 minutes before being removed from the crates. After this time they may be handled without losing soil.

7. SPECIES PRODUCTION TARGETS.

The species which shall be produced to fulfill this contract, their production targets and minimum acceptable sizes are listed in the Species Production Target table (attached). These targets represent the number of

each species to be provided through this contract. However, the targets may be adjusted, as described in 7.a. The Contractor and staff of VNC shall jointly establish a Species Production Plan, based on seed availability, seed viability and the quantity needed for ongoing restoration projects at the LRGV NWR. The Species Production Plan shall show the quantities of each species that the Contractor shall produce. The Contractor's periodic production estimates (see Section 9) indicate discrepancies from the Species Production Plan. The Contractor shall promptly notify VNC of any discrepancies from the Species Production Plan. Species substitutions or other modifications of the Species Production Plan must be approved by VNC in writing. LRGV NWR reserves the right to reject seedling deliveries that differ by more than 10% of the established production goal for any species.

7.a. Species Substitutions. In any given year, viable seeds of some species may not be available. For this reason, the targets for one species may be added to the targets for other species, up to the limits indicated in the Species Production Targets table. These limits are shown as substitution factors, which are multiples of the original target. For example, if the target for one species is 500, and the substitution factor is 2, then this target can be increased up to 1000.

7.b. Deduction for Cost of Seeds Provided by LRGV NWR.

Since there are no commercial seed sources for the species to be produced, the Contractor shall collect the seeds needed to fulfill the contract from the wild in locations not more than 70 miles away from Santa Ana NWR. However, the LRGV NWR will provide seeds which the Contractor is unable to obtain, provided that the seeds are available in the LRGV NWR seed bank. VNC will deduct $0.03 per Midi seedling produced with seeds supplied by the LRGV NWR. This deduction represents average costs incurred in the collection, processing, treatment and storage of native seeds of these types. These deductions shall be subtracted from the Contractor's bid price for delivered seedlings (Section 13). The Contractor shall keep accurate records of the numbers and species of seedlings produced with seeds obtained by the Contractor and those produced with seeds supplied by VNC. VNC will verify that the figures are accurate.

7.c. Failure to Complete Contract and Deduction of Cost of Plant Bands Provided by LRGV NWR.

Lower Rio Grande Valley NWR, the recipient of the delivered seedlings, will purchase all Plant Band containers required under this contract, since this product is significantly less expensive when ordered in large quantities. The LRGV NWR will provide at no charge to the Contractor the quantity of Plant Bands specified in the contract, plus a 15% surplus. Under normal nursery operations, a loss of up to 10 percent of Plant Bands can be expected. The Contractor shall sign a property receipt form acknowledging receipt of the Plant Bands. If the Contractor is unable to deliver the total quantity of seedlings specified under this contract, VNC shall subtract from the seedling payment the cost of the Plant Bands for the undelivered portion of the contract (see formula in section 13). In 2002, the unit price per "Midi" Plant Band (8" x 1.5" HP) was $0.0497 ($49.70 per thousand).

For example, assume that the contract production goal is 50,000 seedlings. The LRGV NWR will provide 15% more than 50,000 (57,500) Plant Bands. If the Contractor only delivers 45,000 seedlings as of November 15, 2005, the seedling payment shall be reduced by the amount of 5000 Plant Bands times $0.0497, or $248.50.

8. CULTIVATION TECHNIQUES.

Seedlings produced under this contract shall be cultivated by the techniques listed in this section. All changes or modifications of these techniques shall be approved, in writing, in advance by VNC personnel; failure to do so will result in seedlings which VNC will not accept.

8.a. Cultivation from Seed.

VNC will accept only those seedlings which have been grown from seed. The purpose of this requirement is to provide greater genetic diversity in the restored plant populations. Vegetatively reproduced plants (clones) are genetically identical to the source plant.

8.b. Seed Germination Time and Techniques.

Cultivation of each species shall begin early enough to allow the seedlings to reach an appropriate size by October 1, 2006. Seedlings which have surpassed a stem height of 12" shall be pruned to 10" in height. Seedlings which failed to reach the minimum acceptable size will be rejected; minimum acceptable sizes for each species are shown in the Production Target table. Plant Bands are designed to decompose after about 8 months of exposure to moisture and soil. The earliest permissible date to begin cultivation of any species in Plant Bands shall be January 15.

VNC will provide written instructions, upon request, on germination techniques for each species to be cultivated. The Contractor shall utilize these germination techniques in all cases where seeds are supplied by VNC. This requirement includes the use of moist aeration for the germination of most species. Moist aeration is accomplished by immersing seeds for specified periods of time (ordinarily 12 hours to 3 days, depending on species) in water-filled jars, which are aerated by means of scintillation stones and aquarium pumps. An ordinary 50-gallon aquarium pump, plastic tubing, gang valves and 4 scintillation stones is sufficient to moist aerate 4 seed lots simultaneously; this equipment can be purchased for less than $40. The Contractor may utilize other germination techniques on seeds that are self-provided.

8.c. Air Pruning and Bench Cultivation.

Throughout the cultivation period, all seedlings shall be supported on benches covered with 1/4" hardware cloth or a similar type of screen, so that the bottoms of the Plant Bands are exposed to the air. This "air pruning" of roots prevents long tap-roots from extending into the ground or entering other Plant Bands. Once the tap-roots have been "air-pruned", lateral roots proliferate and fill the Plant Band. Properly air-pruned seedlings have greater rates of survival and growth in the field. However, the Contractor may delay air-pruning of seedlings for up to 3 weeks after seeds have germinated, in order to store the Plant Bands in a seed germination chamber, shade structure or temperature-controlled incubator. Seedlings which have not been air-pruned will not be accepted.

VNC will not accept seedlings that have been stored in seedling shipping crates ("milk crates") throughout the cultivation period. Previous experience has shown that separation and sorting of seedlings and removal of empty Plant Bands (Section 8.f.) cannot be accomplished effectively when seedlings have been grown within the shipping crates, rather than on an open bench.

8.d. Exposure to Sunlight.

Throughout the cultivation period, all seedlings shall be grown outside. All seedlings shall be exposed to full direct sunlight for at least 8 hours per day, beginning no later than July 1 and continuing until delivery of the seedlings. This ensures that the seedlings will be able to withstand exposure to sunlight once transplanted in the field. Furthermore, exposure to natural rainfall, when it occurs, will leach accumulations of alkali salts which occur naturally in river water and ground water in this region. Rainwater greatly improves the growth and health of native seedlings grown in this region. However, seedlings may be stored inside a greenhouse or germination chamber until May 1, to permit early germination of slow-growing species. Also, seedlings may be grown under a shade-cloth during the first month after germination or transplant to the Plant Bands, to encourage survival and growth of sensitive species. Under no circumstances shall any seedlings be stored inside or under shade cloth after July 1.

8.e. Number of Seedlings per Plant Band.

Each Plant Band shall contain one and only one seedling. In cases where more than one seed germinates in a Plant Band, it shall be thinned to one seedling within two weeks after germination. All empty Plant Bands shall be removed from cultivation benches so that they may be replanted.

8.f. Separation of Seedlings, Sorting by Size and Removal of Empty Plant Bands.

All seedlings shall be separated from adjacent seedlings and re-sorted at least once during every three months of cultivation. The separation of containers breaks off any roots which have grown into adjacent Plant Bands. At the same time, all smaller sized seedlings shall be regrouped together so that they shall not be shaded by larger seedlings. Empty Plant Bands shall be removed from the bench so that they may be replanted. Previous experience has shown that a large portion of the Contractor's cost for seedling production is due to packing soil in the Plant Bands. Therefore, the efficient re-planting of all packed Plant Bands that do not contain live plants greatly enhances the profitability of commercial seedling production.

8.g. Watering, Fertilization and Hardening Off.

As stated in Section 7.d., all seedlings shall be exposed to full direct sunlight for at least 8 hours per day after July 1. As seedlings approach the optimum size, they shall be watered only as often as needed to prevent wilting. In most cases, once the seedlings have established in the Plant Bands (after 2 to 4 weeks), they will not need to be watered more often than once every 2 days, even in the hottest weather. However, Montezuma baldcypress may require daily watering. It is far better to water established seedlings thoroughly, but less often, than to provide more frequent light watering. Seedlings which wilt in less than two days after watering may be suffering from accumulations of alkali salts. This problem may be alleviated by an extra-thorough watering to leach salts from the Plant Bands. However, leaching also washes nutrients from the soil, so it shall be done only when necessary. Excessive exposure to wind may also cause seedlings to require more frequent watering. This problem should be alleviated by using windbreaks, such as shade cloth mounted vertically around the perimeter of the nursery.

The slow-release fertilizer used in the Native Soil Mix supplies most of the fertilizer needs for the seedlings. Growth and survival of newly germinated or transplanted seedlings is usually improved by applying a dilute solution of soluble or foliar fertilizer. Certain species may also require additional applications of chelated Iron or other chelated micronutrients; this is especially true for Sierra Madre Torchwood, Guayacán, Lotebush, Texas Persimmon and *Pisonia aculeata*. The plant requirement for supplemental chelated Iron also depends greatly on soil chemistry, which varies from site to site and is difficult to predict. Non-chelated forms of Iron and other micronutrients have very little benefit to nursery plants, due to the high soil pH in this region. Chelated Iron products tend to be expensive, on a per weight basis, but only very small quantities are needed per application. The use of chelated Iron will prevent Iron deficiency problems for a minimal cost (see the Supplemental Information on Material and Labor Costs). For these reasons, the Contractor shall apply chelated Iron, at the medium dosage rate recommended by the manufacturer, at least once every two months during the nursery cultivation of the seedlings. The Chelated Iron product used shall be formulated for alkaline soils. The last application shall be made between September 1 and September 15, 2006.

8.h. Optimal Sizes and Pruning of Seedlings.

The optimal stem height of Midi Seedlings (grown in 1.5" x 8" Plant Bands) is 8" to 12". Seedlings which are taller than 12" will have more foliage and stem than the limited root system can support, and therefore will have poor survival once transplanted. All Midi Seedlings taller than 12" shall be pruned to a stem height of 10". In some cases, seedlings may have to be pruned more than once.

8.i. Additional Recommendations on Cultivation Techniques.

The Contractor is strongly encouraged to adopt the following seedling cultivation strategy. Plant Bands which have been direct seeded, or into which newly germinated seedlings have been transplanted from

germination trays, should be stored on separate benches where they can be provided optimal conditions for germination and establishment of the seedlings. Normally, this consists of protection under shade cloth (typically 80% shade cloth), and several waterings per day with fine mist to avoid damaging tender young sprouts. The newly planted Plant Bands are not moved to the main cultivation benches until all seeds have germinated and seedlings are firmly established. At this point, Plant Bands with viable seedlings are separated from Plant Bands without seedlings. The Plant Bands with viable seedlings are then stored on sections of nursery bench consisting of solid blocks of the same species and same age, with no empty Plant Bands. The empty Plant Bands (i.e., those without seedlings) are then replanted and stored under shade and mist watering. This cultivation strategy produces the highest possible germination rates, the most efficient utilization of bench space and Plant Bands, the highest quality seedlings and the most accurate inventories.

Some native plant nurseries have attempted to cultivate seedlings by an alternative strategy, which is not recommended. This strategy consists of first placing Plant Bands directly on the main cultivation benches, then direct seeding the Plant Bands. Periodically, the Plant Bands not containing seedlings, which are interspersed among Plant Bands with seedlings, are replanted without being separated. The following problems typically result from this technique. The established seedlings are exposed to dense shade and mist watering, conditions which are necessary for optimum seed germination. The established seedlings then become spindly and are difficult to harden-off. Alternatively, if the established seedlings are exposed to full sun and less frequent, heavier watering, conditions necessary for proper seedling development, seed germination in the remaining Plant Bands is reduced. Soon, the older, taller seedlings begin to shade the younger, shorter ones, which stunts their growth and reduces their survival and quality. Once seedlings have produced dense foliage, it is very difficult to tell how many Plant Bands are still empty. Furthermore, some nurseries maintain mixes of species in the same section of the nursery bench. This results in very inaccurate inventories, and often overestimates the actual number of seedlings.

9. PERIODIC AND FINAL INVENTORY OF SEEDLING PRODUCTION.

The Contractor shall provide the LRGV NWR with two estimates of seedling production, due on July 15 and August 15. These estimates shall indicate separately the numbers of each species (1) established in the Plant Bands, (2) currently being germinated in Plant Bands, (3) currently being germinated in germination trays, (4) germinated in trays and available for transplant into Plant Bands, and (5) proposed or planned production that the Contractor expects to be able to produce under the terms of this contract. The Contractor may calculate these estimates by any appropriate means. However, production in excess of the Species Production Goal for any species, that has not been indicated by the seedling production estimate and/or approved in advance by VNC, shall be subject to rejection.

The Contractor shall provide a final inventory of the numbers of each species of all seedlings produced under the terms of this contract by September 20, 2006. This inventory shall be calculated by the method described below. This inventory technique requires that blocks of even-aged seedlings of only one species are grouped in regular rows and columns in discreet sections of nursery bench. If this is not the case, the only approved option is an actual count of each individual seedling.

9.a. Inventory Technique.

In this method, a "column" of seedlings is parallel to the length of a nursery bench, and a "row" is perpendicular to the length of the bench. For each even-aged block of one species, count the number of rows (X). Within this block, select at least 5 stratified sample rows, and no fewer than 5 sample rows per 10' of bench length; the total number of rows selected is Y. In order to select stratified rows, divide X by (Y+1); this is the number of rows between selected sample rows. Count the total number of *live* seedlings encountered in the selected rows (Z), and calculate the average number of live seedlings per row (Z/Y). The total number of seedlings expected in the block is the number of rows multiplied by the average

number of seedlings per row (X*Z/Y).

For example, assume that a block of bench 12 feet long contains an even-aged group of Brasil seedlings. The number of rows in the block is counted and found to be 94, and each row contains 25 Plant Bands. Six rows are sampled, and the space between the sample rows is 94 divided by 7. In other words, every 13th row is sampled. The numbers of live seedlings found on the sampled rows are 21, 17, 18, 22, 23 and 21, so the average number of seedlings encountered is 20.3 per row. Therefore, the total number of live Brasil seedlings expected in this block is 1,911, which is 81% of the total of 2,350 Plant Bands.

9.b. Accuracy and Time Consumed to Complete Inventory.

This inventory technique can be completed in one to four hours for every 20,000 seedlings in a well-organized nursery. The technique consistently produces results that differ by less than 10% of the actual number of live seedlings present in each block. Furthermore, this error is randomly distributed; that is, there is an equal chance that the error on any block is greater or less than the actual number of seedlings. Therefore, when the inventory for all blocks is totaled, the error in the total number of seedlings inventoried for an entire nursery is usually less than 3%. Nevertheless, this technique is inaccurate when multiple species or different age groups are present within the same block, or when seedling mortality on the bench is very high or highly variable. This should not occur, because Section 8.f. requires benches to be sorted and empty Plant Bands removed at least once for every 3 months of cultivation.

10. PACKING SEEDLINGS INTO SEEDLING CRATES.

The Contractor shall pack all seedlings into seedling crates at delivery time. LRGV NWR personnel will notify the Contractor at least 1 week in advance of the species and numbers of seedlings to be packed into crates. The seedling crates will be provided by the LRGV NWR. The LRGV NWR will deliver the first shipment of empty crates to the Contractor's facility. After that, the Contractor shall pick up empty crates when he/she delivers full crates to the Refuge headquarters. Midi Seedlings (8" x 1.5" Plant Bands) shall be packed 49 live seedlings per crate. Mini Seedlings (6" x 1.25" Plant Bands shall be packed 81 live seedlings per crate.

The Contractor shall label each seedling crate with colored flagging provided by VNC; this will help prevent confusion if two or more contractors deliver seedlings at the same time. The Contractor shall write the species name in indelible ink on the flagging for the following species, since they are difficult to distinguish from other similar species: Huisache (*Acacia farnesiana*), huisachillo (*Acacia schaffneri*), Wright's acacia (*Acacia wrightii*), Gregg's acacia (*Acacia greggii*), mescat acacia (*Acacia constricta*), guajillo (*Acacia berlandieri*), paloverde (*Cercidium texanum*) and border paloverde (*Cercidium macrum*).

11. SEEDLING DELIVERY.

The Contractor shall transport packed seedling crates to the U.S. Fish and Wildlife Service (FWS) facility at Santa Ana NWR.

11.a. Time and Scheduling of Delivery.

All seedlings shall meet the contract specifications and be available for delivery by September 15, 2006. Delivery of seedlings shall take place beginning September 15, 2006 and shall be completed no later than October 1, 2006. The rate at which seedlings shall be transported depends on the progress and scheduling of seedling transplanting operations on refuge tracts. A number of factors, such as excessively dry or wet weather, may temporarily delay transplanting and delivery operations. The Contractor shall be able to store seedlings at its facility until final delivery on October 1, 2006. LRGV NWR personnel will call the Contractor one week in advance of each delivery date to indicate the quantities and species of seedlings to be delivered. Once the packed seedling crates have been loaded onto the Contractor's vehicle, they must be

transported to Santa Ana NWR within 24 hours. Packed seedling crates shall not be left in contact with the ground or any solid surface for more than 24 hours.

The Contractor should be aware that LRGV NWR personnel are available to receive deliveries only between the hours of 8:00 AM and 4:00 PM, Monday - Friday. In addition, LRGV NWR personnel will not be available on scheduled holidays. During the three-month delivery period, the scheduled holidays are Labor Day (first Monday in September), Columbus Day (second Monday in October), and Veterans Day (November 11).

11.b. Type of Vehicle.

Vehicles and trailers used to transport the seedlings shall be owned or leased by the Contractor. Seedling crates shall be transported in the upright position with seedling stems oriented vertically; otherwise, seedlings would tumble out of the crates, resulting in damage and loss of seedlings. Seedling crates shall be restrained from sliding or tipping over during transport. Seedlings shall be protected from wind at all times during transport. This requirement can only be fulfilled if the bottom, sides and top of the transport vehicle are completely covered by means of canvas, nylon, plywood or other material that is impermeable to wind. The Contractor shall take measures to prevent damage to seedlings from the vibrations of fabric tarps which results from wind at normal highway speeds. Packed seedling crates shall not be left in covered trailers in full sun for more than 4 hours, since excessive heat would damage the seedlings.

Seedling crates are made from plastic and are 13" wide x 13" deep x 11" tall. The seedlings packed into the crates are up to 20" tall. Packed seedling crates weigh approximately 40 pounds each. The seedling crates have one handle-hole on each of four sides. Only one layer of seedling crates shall be transported at one time. However, more than one layer of seedling crates may be transported, if the vehicle is fitted with a frame or shelf which supports the upper layer of crates at least 15" above the lower layer, to prevent damage to the lower layer of seedlings. Under no circumstances shall seedling crates be placed directly on top of other seedling crates which contain seedlings. The Contractor shall take into account the weight of the seedlings and their center of gravity to assure that the loaded vehicle is safe to drive on public highways.

In order to reduce the shock from packing and transporting seedlings, the Contractor shall water the packed seedling crates immediately prior to transport. This final watering may be done after crates are loaded into the transport trailer.

11.c. Loading and Unloading.

The Contractor shall load all seedling crates into the transport vehicle at the point of departure and shall unload all seedling crates at the seedling staging area at Santa Ana NWR. After unloading packed seedling crates at Santa Ana NWR, the Contractor shall load the next shipment of empty crates in preparation for the next delivery of seedlings.

11.d. Invoices.

The Contractor shall provide an invoice for each seedling delivery, showing the name, address and telephone number of the nursery, the date of each delivery, the species being delivered, quantities of each species, unit prices and total prices for each species, and the total price for each delivery. Since common names are ambiguous, the invoices shall use the 6-letter code names listed in the species production targets. The invoice form shall have a blank for signature and date to verify receipt and inspection. In order to facilitate tracking and organizing the invoices, it is advisable to sequentially number the invoices. An example of an approved invoice format is shown below; note that the example contains a math error, which is easily detected through cross-checking the sums.

FULANO DE TAL NURSERIES **INVOICE NUMBER: 2006-7**

P.O. Box 999
Jardín Espinoso, TX 78500
Tel: (956) 999-8888

Delivery Date: Sep 25, 2006

CODE	Species	No. Crates	No. Individuals	Total	Unit Price	Extension
ABUTRI	Abutilon trisulcatum	15	0	735	$0.65	$477.75
ADEVAS	Adelia vaseyi	25	0	1225	$0.65	$796.25
AMYMAD	Amyris madrensis	20	0	980	$0.65	$637.00
EUPODO	Eupatorium odoratum	7	0	343	$0.65	$202.95
GUAANG	Guaiacum angustifolium	18	24	906	$0.65	$588.90
VIGSTE	Viguiera stenoloba	13	39	676	$0.65	$439.40
XYLFLE	Brush Holley	0	35	35	$0.65	$22.75
TOTAL		98	98	4900		$3,165.00

Received By: _____ Date: _____

11.e. Emergency Seedling Transport by LRGV NWR Personnel.

If the Contractor is unable to deliver seedlings that are urgently needed, LRGV NWR personnel will have the option of picking up seedlings at the Contractor's facility. The Contractor shall therefore provide appropriate access for the trucks and 18-ft trailers used by the LRGV NWR personnel so that they are able to enter and leave easily. If this access is not readily available, the Contractor shall be responsible for transporting the seedlings to a site with easy access.

12. INSPECTION.

12.a. Periodic Inspection of the Nursery.

LRGV NWR personnel will make periodic inspections of Contractor's nursery operations, as needed, during the seedling cultivation period. These inspections are intended to detect, prevent and correct problems at an early stage, and to provide an opportunity for the Contractor to consult with VNC personnel.

12.b. Final Inspection.

Personnel at the LRGV NWR will inspect each shipment of seedlings at the time of delivery at Santa Ana NWR to verify that the numbers, species and prices of seedlings received match the statement sent by the Contractor. Only live seedlings of the species and size limits stated in the Species Production Plan (Section 7) shall be accepted for payment. Likewise, species produced in excess of the limits, without VNC authorization, as described in Section 7, shall be rejected. All live, unacceptable seedlings, and all dead seedlings and empty Plant Bands shall be returned to the Contractor, at the Contractor's request, in order to verify the numbers of unacceptable seedlings delivered. Signature by personnel of the LRGV NWR indicates concurrence; any discrepancies shall be noted at the time of delivery, and VNC shall be notified immediately. Personnel of the LRGV NWR will provide all signed invoices to VNC.

13. PAYMENT.

Payment shall be based on the number of acceptable seedlings delivered, on the bid price of seedlings, possible deductions for seed supplied by the LRGV NWR (Section 7.d.), and possible deductions for wasted Plant Bands (Section 7.e.). The total amount owed for all seedlings delivered on or before October 1, 2006, shall be paid in full by VNC by December 15, 2005.

As described in Sections 3 and 7.d., $0.03 shall be deducted from the base price per seedling for each seedling that was produced from seed supplied by the LRGV NWR.

As described in Section 7.e., the payment for seedlings shall be reduced by the cost of Plant Bands for the undelivered portion of the contract, according to the following formula.

X = Quantity of seedlings to be produced under this contract.
Y = Actual quantity of acceptable seedlings delivered to LRGV NWR.
Z = Unit price per Plant Band (including shipping charge).

Deduction = Z(X-Y)

EXAMPLE: Contracted production goal is 35,000 seedlings.
Contractor delivers 27,800 seedlings.
Unit price of Plant Bands @ $49.70 per thousand (price subject to change).
Deduction from seedling payment = $0.0497(35,000 - 27,800) = $357.84.

*** DEADLINE: June 12, 2006 ***

I, the contracted grower, have read the entire 2006 Seedling Contract & Specifications for BURNED AREA REHABILITATION AT LRGV NWR. I understand and agree with the entirety of its text. I hereby accept the terms of this contact and will adhere by them:

Grower:_____

Address:_____

City:_____ **State:**_____ **Zip:**_____

Phone:_____

E-mail:_____

Signature:_____

Date:_____

Please return this page (pg 10) after filling in the necessary information, signing and dating it. Please make a copy of this page and keep for your records. You should also keep pages 1 – 9 of this document for further references, and you only need to return page 10.

**** <u>This page (pg 10) along with the signed Bid Sheet should be mailed to:</u>**

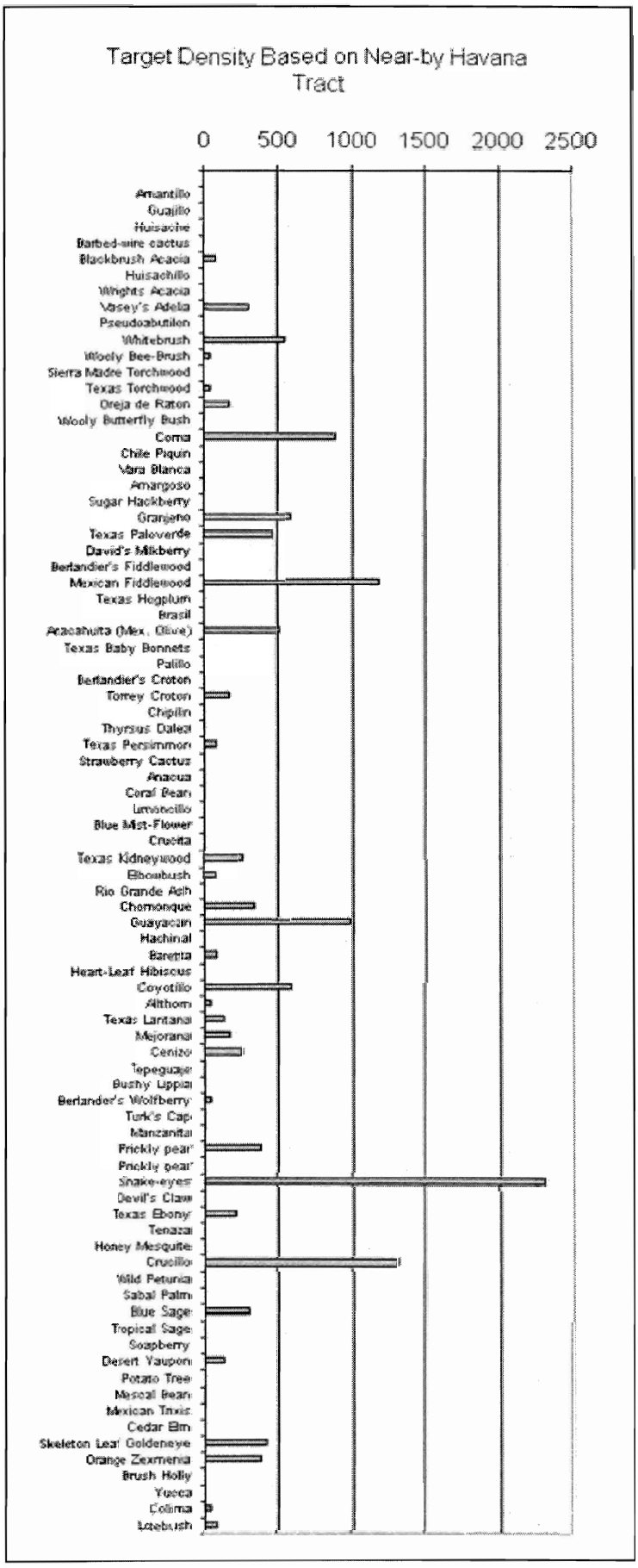
Valley Nature Center
Seedling Administrator
PO Box 8125
Weslaco, TX 78599

IV.3. Unpublished dominant plant cover data from native brush near-by Havana North tract.

2007 BAR Seedling Inventory
Lower Rio Grande Valley NWR
9/20/2007

		Sam Fordyce (23.5 acres)	
CODE	***SPECIES***	**COMMON NAME**	Target based on Havana
ABUTRI	*Abutilon trisulcatum*	Amantillo	0
ACABER	*Acacia Berlandieri*	Guajillo	0
ACAFAR	*Acacia minuata*	Huisache	0
ACAPEN	*Acanthocereus pentagonus*	Barbed-wire cactus	0
ACARIG	*Acacia rigidula*	Blackbrush Acacia	84
ACASCH	*Acacia Schaffneri*	Huisachillo	0
ACAWRI	*Acacia wrightii*	Wrights Acacia	0
ADEVAS	*Adelia vaseyi*	Vasey's Adelia	295
ALLLOZ	*Allowissadula lozanii*	Pseudoabutilon	0
ALOGRA	*Aloysia gratissima*	Whitebrush	547
ALOMAC	*Aloysia macrostachya*	Wooly Bee-Brush	42
AMYMAD	*Amyris madrensis*	Sierra Madre Torchwood	0
AMYTEX	*Amyris texana*	Texas Torchwood	42
BERMYR	*Bernardia myricaefolia*	Oreja de Raton	168
BUDSES	*Buddleja sessiliflora*	Wooly Butterfly Bush	0
BUMCEL	*Bumelia celastrina*	Coma	884
CAPANN	*Capsicum annuum*	Chile Piquin	0
CAPINC	*Capparis incana*	Vara Blanca	0
CASTEX	*Castela texana*	Amargoso	0
CELLAE	*Celtis laevigata*	Sugar Hackberry	0
CELPAL	*Celtis pallida*	Granjeno	589
CERTEX	*Cercidium Texanum*	Texas Paloverde	463
CHIALB	*Chiococca alba*	David's Milkberry	0
CITBER	*Citharexylum berlandieri*	Berlandier's Fiddlewood	0
CITBRA	*Citharexylum brachyanthum*	Mexican Fiddlewood	1179
COLTEX	*Colubrina texana*	Texas Hogplum	0
CONHOO	*Condalia hookeri*	Brasil	0
CORBOI	*Cordia boissieri*	Anacahuita (Mex. Olive)	505
COUAXI	*Coursetia axillaris*	Texas Baby Bonnets	0
CROCOR	*Croton courtesianus*	Palillo	0
CROHUM	*Croton humilis*	Berlandier's Croton	0
CROINC	*Croton incana*	Torrey Croton	168
CRTINC	*Crotalaria incana*	Chipilin	0
DALSCA	*Dalea scandens*	Thyrsus Dalea	0
DIOTEX	*Diospyros texana*	Texas Persimmon	84
ECHENN	*Echinocereus enneacanthus*	Strawberry Cactus	0
EHRANA	*Ehretia anacua*	Anacua	0
ERYHER	*Erythrina herbacea*	Coral Bean	0
ESERUN	*Esenbeckia runyonii*	Limoncillo	0
EUPAZU	*Eupatorium azureum*	Blue Mist-Flower	0
EUPODO	*Eupatorium odoratum*	Crucita	0
EYSTEX	*Eysenhardtia texana*	Texas Kidneywood	253
FORANG	*Forestiera angustifolia*	Elbowbush	84
FRABER	*Fraxinus berlandieriana*	Rio Grande Ash	0
GOCHYP	*Gochnatia hypoleuca*	Chomonque	337
GUAANG	*Guaiacum angustifolium*	Guayacan	986
HEISAL	*Heimia salicifolia*	Hachinal	0
HELPAR	*Helietta parviflora*	Baretta	84

HIBMAR	*Hibiscus martianus*	Heart-Leaf Hibiscus	0
KARHUM	*Karwinskia humboldtiana*	Coyotillo	589
KOESPI	*Koeberlinia spinosa*	Allthorn	42
LANHOR	*Lantana horrida*	Texas Lantana	126
LANMAC	*Lantana macropoda*	Mejorana	168
LEUFRU	*Leucophyllum frutescens*	Cenizo	253
LEUPUL	*Leucaena Pulverulenta*	Tepeguaje	0
LIPALB	*Lippia alba*	Bushy Lippia	0
LYCBER	*Lycium berlandieri*	Berlandier's Wolfberry	42
MALARB	*Malaviscus arborea*	Turk's Cap	0
MALGLA	*Malphigia glabra*	Manzanita	0
OPULEP	*Opuntia leptocaulis*	Prickly pear	379
OPULIN	*Opuntia lindheimeri (engelmanii)*	Prickly pear	0
PHASPI	*Phaulothamnus spinescens*	Snake-eyes	2315
PISACU	*Pisonia aculeata*	Devil's Claw	0
PITEBA	*Pithecellobium ebano*	Texas Ebony	210
PITPAL	*Pithecellobium pallens*	Tenaza	0
PROGLA	*Prosopis Glandulosa*	Honey Mesquite	0
RANRHA	*Randia rhagocarpa*	Crucillo	1305
RUERUN	*Ruellia runyonii*	Wild Petunia	0
SABMEX	*Sabal mexicana*	Sabal Palm	0
SALBAL	*Salvia Ballotaeflora*	Blue Sage	295
SALCOC	*Salvia coccinea*	Tropical Sage	0
SAPSAP	*Sapindus saponaria*	Soapberry	0
SCHCUN	*Schafferia cuneifolia*	Desert Yaupon	126
SOLERI	*Saloanum erianthum*	Potato Tree	0
SOPSEC	*Sophora secundiflora*	Mescal Bean	0
TRIINU	*Trixis inula*	Mexican Trixis	0
ULMCRA	*Ulmus crassifolia*	Cedar Elm	0
VIGSTE	*Viguiera stenoloba*	Skeleton Leaf Goldeneye	421
WEDHIS	*Wedelia Hispida*	Orange Zexmenia	379
XYLFLE	*Xylosma flexuosa*	Brush Holly	0
YUCTRE	*Yucca treculaena*	Yucca	0
ZANFAG	*Zanthoxylum fagara*	Colima	42
ZIZOBT	*Ziziphus obtusifolia*	Lotebush	84
TOTAL		**TOTALS**	13570


Target Density Based on Near-by Havana Tract
0
500
1000
1500
2000
2500
Amantillo
Guajillo
Huisache
Barbed-wire cactus
Blackbrush Acacia
Huisachillo
Wrights Acacia
Vasey's Adelia
Pseudoabutilon
Whitebrush
Woolly Bee-Brush
Sierra Madre Torchwood
Texas Torchwood
Oreja de Raton
Wooly Butterfly Bush
Coma
Chile Piquin
Vara Blanca
Amargoso
Sugar Hackberry
Granjeno
Texas Paloverde
David's Milkberry
Berlandier's Fiddlewood
Mexican Fiddlewood
Texas Hogplum
Brasil
Anacahuita (Mex. Olive)
Texas Baby Bonnets
Palillo
Berlandier's Croton
Torrey Croton
Chipilin
Thyrsus Dalea
Texas Persimmon
Strawberry Cactus
Anacua
Coral Bean
Limoncillo
Blue Mist-Flower
Crucita
Texas Kidneywood
Elbowbush
Rio Grande Ash
Chamonque
Guayacan
Hachinal
Baretta
Heart-Leaf Hibiscus
Coyotillo
Allthorn
Texas Lantana
Mejorana
Cenizo
Tepeguaje
Bushy Lippia
Berlander's Wolfberry
Turk's Cap
Manzanita
Prickly pear
Prickly pear
Snake-eyes
Devil's Claw
Texas Ebony
Tenaza
Honey Mesquite
Crucillo
Wild Petunia
Sabal Palm
Blue Sage
Tropical Sage
Soapberry
Desert Yaupon
Potato Tree
Mescal Bean
Mexican Texis
Cedar Elm
Skeleton Leaf Goldeneye
Orange Zexmenia
Brush Holly
Yucca
Colima
Lotebush